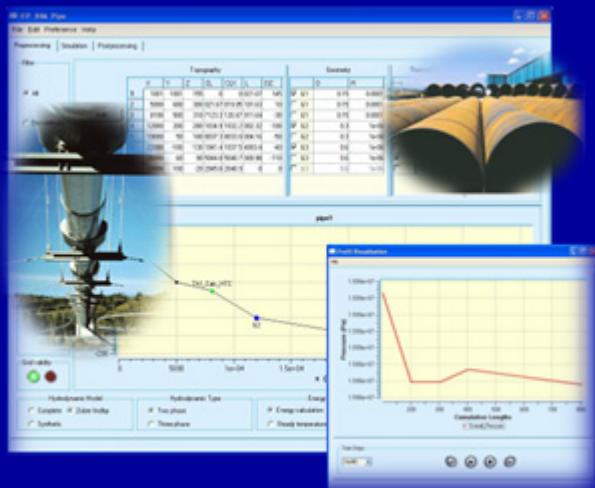
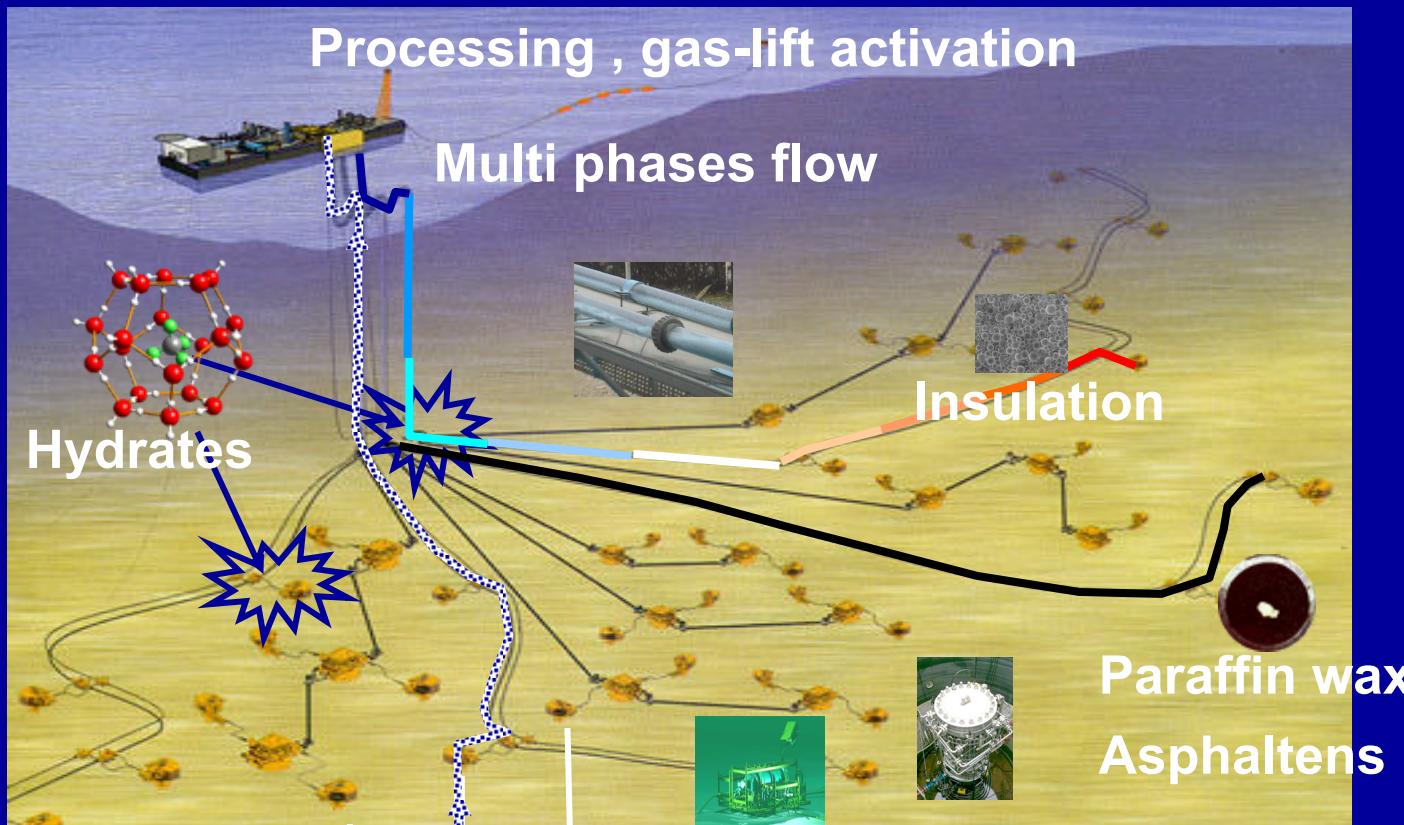


TINA Project



- Motivations and needs
- Current situation
- Project status
- Dynamic unit interface extension
- Demonstration
- Conclusion

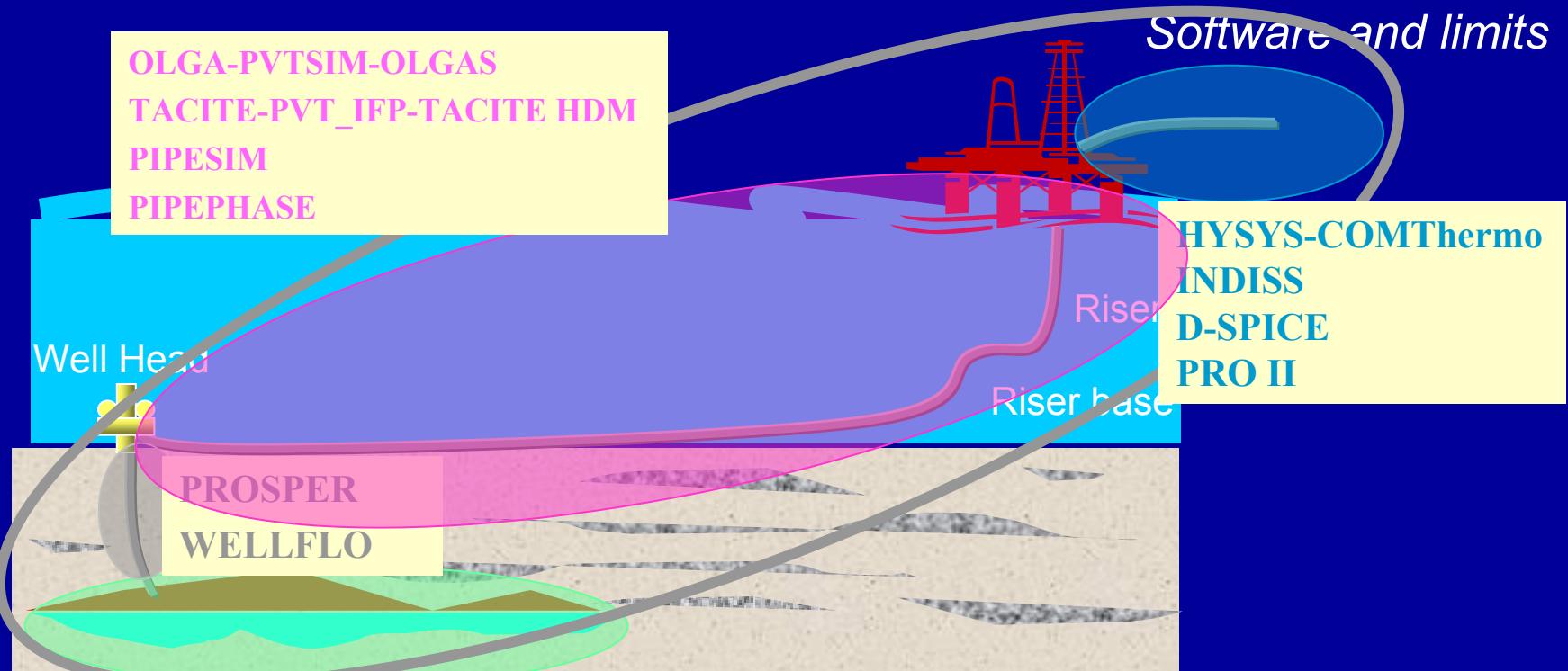


Damage
Sand arrival

Pumping
Separation

TINA Project

- Ensure effluent transportation from the reservoir to the topside applications
 - Manage production system in its all
 - Respect production schedule fixed by the reservoir studies
- Knowing elementary information
 - Reservoir production
 - Nature of the fluid
 - Bottom temperature and pressure
 - Surface pressure
- Respecting a number of constraints
 - Economic (CAPEX, OPEX, RISKEX)
 - Environment
 - Security

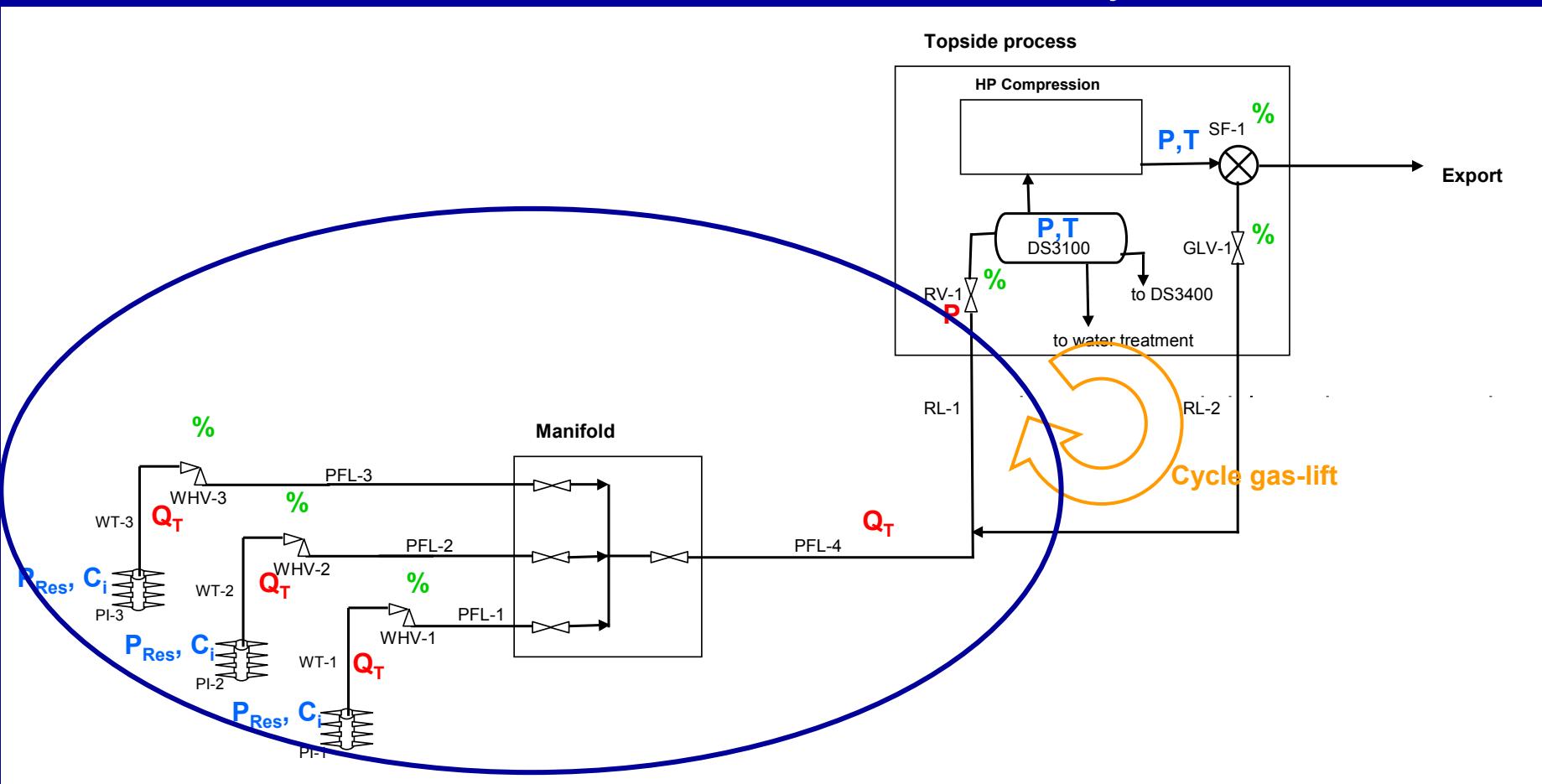


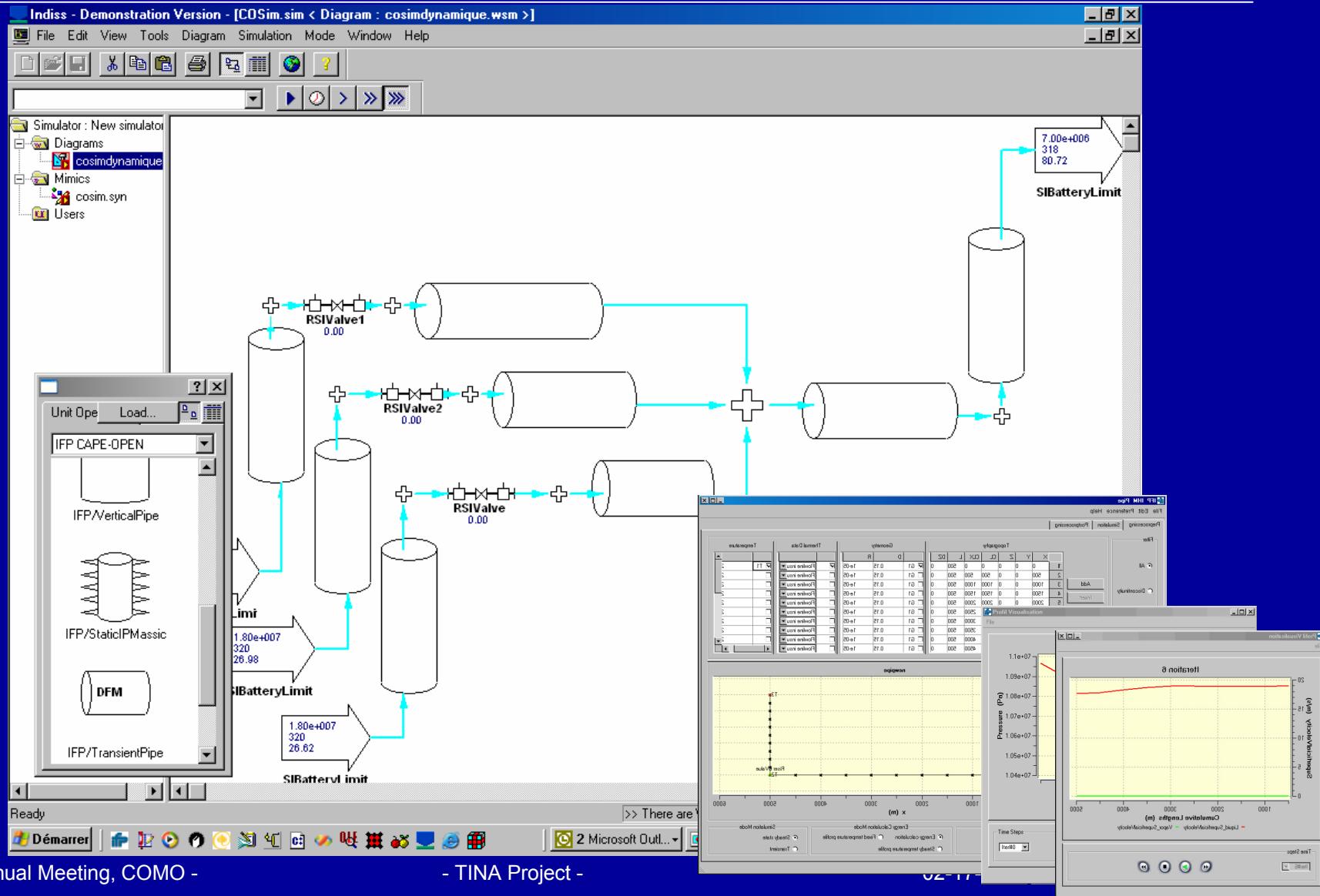
ATHOS
ECLIPSE
MBAL

- Data management (reservoir, fluid, production system,...)
- No model consistency
- No true interoperability between software
- Different resolution modes (dynamic/steady State)

- Development and integration
 - IPR (Inflow Performance)
 - Static Pipe
 - Transient Pipe
- Interoperability
 - RSI Units, IFP Units, ...
 - MultiFlash (V3.3 and 3.4), RSI Thermo
 - HYSYS (V3.1), Pro/II (V7.1)
- Deepwater application case

Static and dynamic simulations





- Three types of unit operations for three interfaces
 - Boundaries
 - A boundary is a network limit, and does not support any specific interfaces but ICapeDynamicUnit.
 - Nodes
 - A Node is a specific unit operation characterised by:
 - Inlet and outlet pressure are identical
 - Hold up.
 - Therefore a node unit operation should implement two interfaces: ICapeDynamicUnit and ICapeNodeDynamicUnit
 - Arcs
 - An Arc is a specific unit operation characterised by:
 - Pressure drop
 - Therefore an arc operation should implement two interfaces: ICapeDynamicUnit and IcapeArcDynamicUnit

- Need for another type
 - There are unit operations that are neither of the arc, nor of the nodes, and even less of the limits of networks.
 - Typically, these unit operations have the following characteristics:



Where F is flow and P is pressure and

- To deal with this kind of unit operation, it is necessary to define a new type and a news interface.
- BiArcs
 - A BiArc is a specific unit operation characterised by:
 - Pressure drop
 - Inlet and outlet flows are different
 - Therefore a BiArc operation should implement two interfaces: ICapeDynamicUnit and ICapeBiArcDynamicUnit

- The platform and its components form a useful integrated tool
 - Design
 - Steady state simulation under constraints
 - Operating procedures
 - Dynamic simulation
 - Shut down-restart
 - Unit cooling and hydrate appearance
 - Data reconciliation
 - Training
- Commercial version is planned for the end of year 2005
- CAPE-OPEN Standard
 - Proposal for Hydrodynamic
 - Improved Dynamic Unit standard